156. A process for treating a material using one or more semiconductor nanocrystal probes to determine the presence of one or more detectable substances in said material which comprises:

a) contacting said material with one or more semiconductor nanocrystal probes, said one or more semiconductor nanocrystal probes each comprising:

i) one or more semiconductor nanocrystals, each capable of, in response to exposure to a first energy, providing a second energy;

ii) one or more first linking agents, at least one of said one or more first linking agents comprising a three-dimensional shaped structure capable of having linked thereto said one or more semiconductor nanocrystals, each of said one or more first linking agents capable of linking to:

1) one or more second linking agents; or

2) one or more affinity molecules; and

iii) one or more affinity molecules linked either to said one or more second linking agents or to said one or more first linking agents, each of said one or more affinity molecules capable of selectively bonding to said one or more detectable substances;

b) exposing said one or more semiconductor nanocrystal probes to said first energy; and

c) detecting said second energy provided by said one or more semiconductor nanocrystals in said one or more semiconductor nanocrystal probes bonded to said one or more detectable substances in said material.

157. The process for treating a material of claim 156, wherein said three dimensional shaped structure is linked to two or more of said semiconductor nanocrystals.

158. The process for treating a material of claim 157, wherein said one or more semiconductor nanocrystal probes comprises two or more of said semiconductor nanocrystals probes.

159. The process for treating a material of claim 158, wherein each of said two or more semiconductor nanocrystal probes comprises:

(α) a semiconductor nanocrystal capable of providing a second energy that is the same as that of the semiconductor nanocrystals of which the others of said two or more semiconductor nanocrystal probes are comprised;

(ß) a semiconductor nanocrystal capable of providing a second energy that is distinguishable from that of the semiconductor nanocrystals of which at least one of the others of said two or more semiconductor nanocrystal probes are comprised; or

(γ) a combination of semiconductor nanocrystals capable of providing a second energy that is the same as or that is distinguishable from that of the semiconductor nanocrystals of which at least one of the others of said two or more semiconductor nanocrystal probes are comprised.

160. The process for treating a material of claim 156, wherein said second energy provided by said two or more semiconductor nanocrystals linked to said three dimensional shaped structure comprises one or more detectable signals.

161. The process for treating a material of claim 160, wherein said one or more detectable signals comprises two or more detectable signals.

162. The process for treating a material of claim 161, wherein each of said two or more detectable signals are distinguishable.

163. The process for treating a material of claim 161, wherein each of said two or more detectable signals are spectrally distinguishable.

164. The process for treating a material of claim 156, wherein said three-dimensional shaped structure is linked by covalently bonding to said one or more semiconductor nanocrystals.

165. The process for treating a material of claim 156, wherein said three-dimensional shaped structure is linked by adherence to said one or more semiconductor nanocrystals.

166. The process for treating a material of claim 156 wherein said three-dimensional shaped structure is linked by embedding to said one or more semiconductor nanocrystals.

167. The process for treating a material of claim 156, wherein said three-dimensional shaped structure further comprises one or more organic materials.

168. The process for treating a material claim 156, wherein said three-dimensional shaped structure further comprises one or more inorganic materials.

169. The process for treating a material of claim 156, wherein said three-dimensional shaped structure comprises a porous solid structure which encapsulates said one or more semiconductor nanocrystals.

170. The process for treating a material of claim 156, wherein said three-dimensional shaped structure comprises a non-porous solid structure which encapsulates said one or more semiconductor nanocrystals.

171. The process for treating a material of claim 156, wherein said three-dimensional shaped structure comprises a hollow structure which encapsulates said one or more semiconductor nanocrystals.

172. The process for treating a material of claim 156, wherein said three-dimensional shaped structure comprises a spherically shaped structure.

173. The process for treating a material of claim 156, wherein said three-dimensional shaped structure comprises two or more substructures wherein each substructure comprises one or more identical semiconductor nanocrystals.

174. The process for treating a material of claim 172, wherein said two or more substructures each comprise one layer in a layered structure.

175. The process for treating a material of claim 156, wherein said three-dimensional shaped structure comprises a medium transparent to:

i) said first energy to which said one or more semiconductor nanocrystals is exposed; and

ii) said second energy provided by said semiconductor nanocrystals in response to said exposure to said first energy.

176. The process for treating a material of claim 156, wherein each of said one or more affinity molecules comprises a protein, a molecule of one or more strands of nucleic acid, a polysaccharide or a small molecule.

177. The process for treating a material of claim 175, wherein each of said one or more affinity molecules comprises a molecule of one or more strands of nucleic acid.

178. The process for treating a material of claim 176, wherein each of said one or more detectable substances comprises a molecule of one or more strands of nucleic acid with which said probe bonds.

179. The process for treating a material of claim 175, wherein each of said one or more affinity molecules comprises a protein.

180. The process for treating a material of claim 178, wherein the protein is an antibody.